

November 7, 1952



To: Western Area Office
Field Personnel

From: R. G. Zook, Director
Western Area Office

Subject: **Retail Rate Problems In Connection with Increased Farm and Ranch Loads and Electric House Heating**

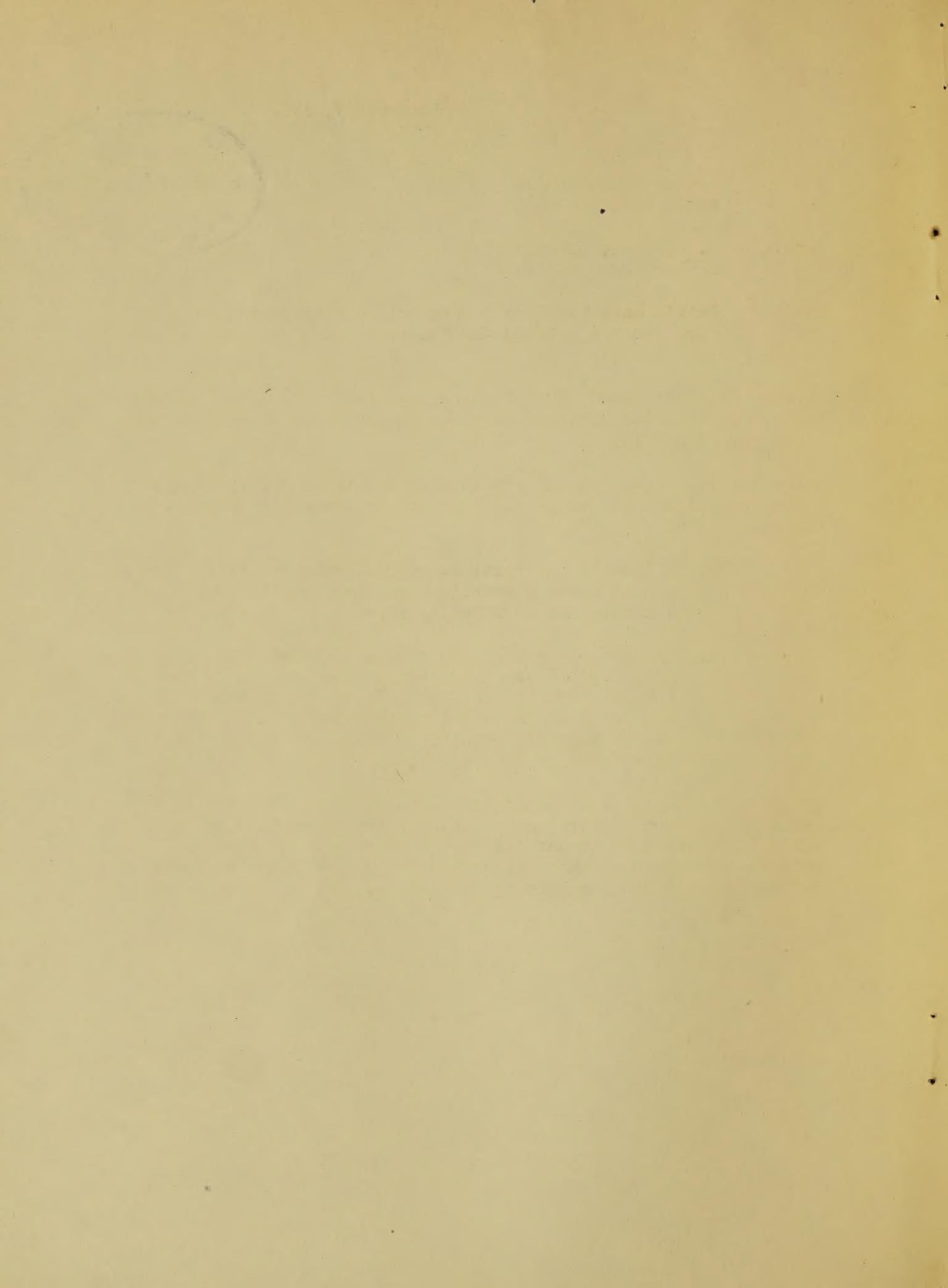
In line with the discussion of large farm loads and house heating loads, the material attached has been prepared for discussion and study purposes only.

After outlining the rate difficulties encountered certain concrete suggestions are submitted. The suggestions are controversial, namely:

1. Eliminate the rural commercial rate and bill single phase commercial consumers on the rate for farm and residential service.
2. Insert in the farm and residential rate a demand provision which would result in an added charge to consumers with large demands but so designed that more than 95% of the farm and residential consumers would not be affected under present conditions.

While the adoption of a demand provision is sound from the standpoint of the cost of furnishing service, the opposition on the part of consumers to demand charges is so widespread that we will not recommend a demand provision in farm rate unless there is support from REA managers and directors.

Attachment



MATERIAL ON FARM AND COMMERCIAL RATES

With the rapid increase in the use of electric service on farms for many new purposes, the usage of many large farms and ranches are today comparable to those of moderate sized commercial and industrial consumers. A small but increasing percentage of farms now have maximum demands of 10 to 30 KW and a few large commercial type farms and ranches have even larger demands.

Similarly the present interest in electric house heating is beginning to result in residential heating loads far in excess of the residential kw demands previously experienced.

In some areas where low cost power is available the prospect is for radical increases in capacity requirements of electric distribution systems as a result of electric house heating.

Because of these changing conditions, REA systems are encountering rate difficulties which are described below and every year they become more evident. In assisting our borrowers to meet these difficulties the Operations Division wishes to have the benefit of the advice and experience of the managers and directors of REA systems.

1. Classification for rate purposes of Farm Consumers as distinguished from Commercial Consumers.

It has always been difficult to formulate equitable rules for distinguishing between farm and commercial consumers for rate purposes and this difficulty is increasing because an increasing number of farms have service requirements similar to commercial

consumers. For example, farms which process their own farm products have the same electric equipment as commercial poultry hatcheries, creameries or commercial feed and grain grinding establishments. Therefore, some non-farm commercial consumers appear to be justified in considering that they are being discriminated against when required to pay on a commercial rate higher than the rate of a neighboring farmer who performs the same operations or whose electric requirements are very similar.

While REA has always recommended that, in general, all farms should be served on the farm and residential rate, it would be possible to formulate rules for excluding certain commercial types of farms and placing a limit on the kw demand allowed under the farm and residential rate. Some REA systems have adopted such rules and so have many utility companies. The Tennessee Valley Authority has adopted the rules shown in the attached Exhibit A. However, we find that such rules are difficult to apply and result in many complaints from farmers classified as commercial, particularly those who are borderline cases. Standard REA recommendations for distinguishing between farm and commercial consumers are shown in Exhibit B. By reason of their practical experience with this problem REA borrowers can make a valuable contribution toward the best means of handling it.

2. Proper Allowance in farm and Residential Rates for Consumer's KW Demand.

The standard REA practice is to recommend to each borrower

a Schedule A for Farm and Home Service, with no limit on the permissible size of the load. However, it is for single phase service, and farmers desiring three phase service must pay the commercial rate. Schedule A is designed primarily for residential service. The lowest price block is generally reached after the use of only 200 kwh per month and there is no demand charge. This type of rate is not particularly suited to large farm loads or to house heating loads because the price of the final block is usually so low that service may be furnished at a loss to a large consumer with a poor load factor i.e. a consumer whose kw demand is large in comparison with his kwh usage. For systems which have adopted the Capital Credits Plan it is doubly important that large consumers shall be served at a margin above cost. It may therefore be found advisable to make provision in farm and residential rates for some type of demand charge. There is a trend in this direction among utility companies.

3. Tentative suggestion submitted for consideration.

Bearing in mind the rate difficulties described above, it would be helpful to have the opinion of managers and directors of REA systems on the following tentative suggestion:

1. For single phase service eliminate any distinction between rural residential, farm and commercial consumers and serve all on the same rate. (In villages, different rates may still be desirable) /

2. Incorporate in the rate for rural residential, farm and commercial consumers a demand element which would affect only the large consumers.

For example, the number of KWH in the second block of the Farm and Home Rate might be increased by 40 kwh for each kw of maximum demand in excess of 10 kw. For consumers with demands over 10 kw the increase in the monthly bill resulting from the foregoing provision would be \$1.20 per kw if the price of the second block is 5¢ and the price of the final block of the rate is 2¢ per kwh. The difference is 3¢ and this times 40 is \$1.20.

This provision would not affect the great majority of farms nor would it affect any residences except those installing electric house heating. The attached Exhibit C shows the kw demands of a group of farms surveyed in 1949 and may be considered typical. Only two percent had demands over 10 KW. Information on the demand meters which would be needed is contained in Exhibit D. Demand meters would be installed only on consumers having demands of 10 KW or more.

For three phase service there should be a separate rate which would be higher than the single phase rate for small installations. The same rate for three phase service would be applicable to farm, commercial and power consumers and its availability would, of course, be limited to locations adjacent to 3 phase or V phase lines. Non-farm residential consumers do not require three phase service.

These two rates, one for single-phase service and the other for three-phase service would cover all rural residential, farm, commercial and small power consumers and would eliminate the need for classifying such consumers for rate purposes.

4. Discussion of the foregoing suggestion

There is usually a considerable amount of objection on the part of consumers to a demand charge, but this objection is lessened by incorporating it into the energy charge per kw hr. On account of the objection of consumers to demand charges the probable reaction of consumers should be thoroughly explored. A related objection to the foregoing suggestion of a demand charge is the importance of keeping the rate to residential and farm consumers simple and readily understandable by the consumers.

Alternative suggestions will be welcomed by REA. In the cases of those advocating the retention of separate rate classifications for farm and commercial consumers we will particularly welcome suggestions for distinguishing farm from commercial. It is recognized that many REA systems have had valuable experience in this connection. It is also recognized that local conditions vary and that definitions of farms which are satisfactory in one locality may be unsatisfactory in another locality.

In considering the advisability of using the same rate for farm and commercial consumers it should be borne in mind that the cost per KWH of commercial consumers is generally estimated to be

somewhat greater than that for farm and residential consumers.

This is why it is customary for the commercial rate to be higher.

The two main reasons why the cost per kwh of furnishing commercial service exceeds that of residential and farm service are (1) lower diversified load factors of commercial consumers and (2) less permanence due to ordinary business fluctuations and risks which cause commercial consumers to operate part time, move away or fail. In making the rates identical, the former is taken care of by the demand charge so far as demands over 10 KW are concerned, but not for smaller demands. Factor No. 2 may be taken care of to some extent in the contract for service by adequate term of contract, cash deposits (in some cases) and where line extensions are involved, adequate minimum charges. In general the adoption of one rate for farm and commercial service would result in a certain amount of reduction of commercial revenue, but we believe that a proper margin above the cost of furnishing commercial service could be maintained.

EXHIBIT A

Regulations of Tennessee Valley Authority regarding rate applicable to farm service:

1. Domestic Farm Use. A farm on which is located a single dwelling and its appurtenances, including barns, domestic servants' quarters, and out buildings, and which processes only its own products, shall be considered a domestic farm and shall be entitled to the residential rate for all its power requirements, including motors up to and including rated capacity of $7\frac{1}{2}$ H.P. Motors of capacities larger than $7\frac{1}{2}$ H.P. shall not be installed except by special agreement with distributor. Service to dwellings other than the main dwelling, such as tenant houses, etc., may be separately metered and billed under the residential rate. This interpretation is not applicable to commercial dairies as defined below.

2. Commercial Farm Use. A farm shall be metered and billed under the appropriate lighting and power rate if other dwellings beside the main dwelling are not separately metered and are served through the same point of delivery or if products of other farms are processed for sale. The main dwelling and domestic servants' quarters may be metered and billed under the residential rate if a separate circuit is provided for all of the other farm uses in cases where products of other farms are processed for sale.

3. Dairies. All dairies having refrigeration equipment with a rated capacity of more than $1\frac{1}{2}$ H.P., or making use of pasteurization equipment for processing milk, or dairies retailing raw milk under laws of ordinances, or inspection or regulation of the city or county, shall be considered nonresidential customers for their dairying power requirements.

EXHIBIT B
REA RECOMMENDATION FOR DISTINGUISHING BETWEEN
FARM AND COMMERCIAL CONSUMERS FOR RATE PURPOSES

All farms should be served on the farm rate regardless of type of farm operations or size of load (provided 3-phase service is not required) and regardless of whether products are sold at wholesale or retail. While some electric systems classify certain farms as commercial, experience indicates the difficulty of distinguishing between one farm and another on any basis such as type, size or method of marketing farm products. The simplest and best course is to draw no distinction between farms.

Processing of products produced on the farm should be regarded as a farm operation. If the processing is done on the consumer's farm and is applied to farm products raised principally by that consumer, he should be classified as a farm consumer and served under the farm rate.

However, he should be classified as a commercial consumer and served under the commercial rate if he makes a business of processing farm products grown elsewhere. For example, a farmer grinding his own feed should be supplied with service under the farm rate. However, if he grinds feed which has not been raised on his own farm and is not for consumption on his own farm, service should be furnished under the commercial rate, even though a portion is ground for his own use.

Similarly a chick hatchery, operated as an adjunct to a poultry farm, should be served on the farm rate, whereas if the eggs are produced elsewhere and the chicks sold when hatched, the hatchery should be considered a commercial consumer.

Dairy farms should likewise be classified as farms even though they pasteurize their milk and sell it at retail along a milk route. If, however, the consumer makes a business of processing or selling milk produced on the farms of others, he should be classed as a commercial consumer.

EXHIBIT C

SUMMARY OF STUDY OF ELECTRIC LOAD CHARACTERISTICS
OF FARMS IN DEKALB COUNTY, ILLINOIS

No. of farms studies 97. Random sample of 1400 farms in the county.

Study conducted by University of Illinois for Central Illinois Light Company in 1949, continued in 1950 and a summary published in the Electrical World in 1951.

TABLE I - ANNUAL KWH SALES TO FARMS OF VARIOUS TYPES

Type of Farm	Per Cent of Total	Average 1948	Annual KWHR Sales 1949	1950	Highest 1950
Dairy -----	22	9,525	10,477	12,250	30,000
Livestock-----	34	6,944	8,564	9,100	30,000
Mixed-----	29	4,260	4,635	5,643	12,000
Produce-----	15	2,809	3,193	3,895	14,800
Average-----	--	6,037	6,913	8,009	-----

TABLE II - CONNECTED LOAD AND DEMAND PER FARM - 1949

Type of Farm	KW Connected Load			KwDemand (15min)	
	Average	Highest	Over 25 KW	Average	Highest
Dairy-----	23.3	45	30%	6.0	12.2
Livestock-----	21.6	43	27%	5.2	10.2
Mixed-----	15.6	25	7%	3.7	6.8
Produce-----	11.8	20	0%	3.0	7.0
Average-----	18.0	--	---	4.5	---

EXHIBIT D

DEMAND METERS

Demand meters would not be required for the great majority of farms. If no demand charge is made for demands of 10 kw or less it is probable that only two or three percent of all farms in typical farming areas would require demand meters. These farms could readily be singled out by their large KWH usage or their need for more than the usual transformer capacity. Residential loads would not require demand meters unless electric house heating was installed. A test could be made to determine the need for installing a demand meter on any given **large consumer**.

The suggested type of meter is a combination watthour and demand meter similar to the General Electric Type IM-30 Watthour Demand Meter costing about \$55.00. In addition to the usual kwh register this meter has a pointer to indicate maximum demand during the current meter reading period and also a cumulative demand register to record demands in previous months. Such meters would be suitable for use on systems where consumers read their own meters. The consumer would read the current demand and set the pointer back to zero. This action would record the demand on the cumulative demand register for future check by the cooperative. If consumer failed to set back the pointer he would be billed for the maximum demand occurring since the pointer was last set back to zero.